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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte RONALD N. CARON, PETER W. ROBINSON,
DEREK E. TYLER, ANDREAS BOEGEL,
DORIS HUMPENODER-BOGEL, HANS-ACHIM KUHN,
and JOERG SEEGER

Appeal 2008-6196
Application 10/657,005
Technology Center 1700

Decided:¹ March 26, 2009

Before EDWARD C. KIMLIN, TERRY J. OWENS, and
MICHAEL P. COLAIANNI, *Administrative Patent Judges*.

COLAIANNI, *Administrative Patent Judge*.

DECISION ON APPEAL

¹ The two-month time period for filing an appeal or commencing a civil action, as recited in 37 C.F.R. § 1.304, begins to run from the Decided Date shown on this page of the decision. The time period does not run from the Mail Date (paper delivery) or Notification Date (electronic delivery).

Appellants seek review under 35 U.S.C. § 134 from the Examiner's rejections of claims 1-7 in the final Office Action. This Board has jurisdiction under 35 U.S.C. § 6(b). We AFFIRM.

STATEMENT OF THE CASE

The invention of the present application is directed to a copper-based alloy having high yield strength and moderately high electrical conductivity. Claim 1 is illustrative and reproduced below.

1. A copper based alloy consisting essentially of, by weight:

from 0.35% to 5% titanium;

from 0.001% to 10% of X, where X is selected from Ni, Fe, Sn, P, Al, Zn, Si, Pb, Be, Mn, Mg, Bi, S, Te, Se, Ag, As, Sb, Zr, B, Cr and Co and combinations thereof; and

the balance copper and inevitable impurities, said alloy having an electrical conductivity of at least 50% IACS and a yield strength of at least 105 ksi.

The Examiner relies on the following prior art as evidence of unpatentability.

Ogura (as translated)	JP 09263864 ('864)	Oct. 7, 1997
Maki (as translated)	JP 2001181759 ('759)	Jul. 3, 2001
Hirai (as translated)	JP 2002038246 ('246)	Feb. 6, 2002

Appellants appeal the following rejections of pending claims 1-7:

1. Claims 1-7 are rejected under 35 U.S.C. § 103(a) as obvious over '759.

2. Claims 5-7 are rejected under 35 U.S.C. § 103(a) as obvious over ‘864 or ‘246.

In the first rejection, Appellants argue independent claims 1 and 5 separately. We therefore address the claims of this rejection in two groups comprising claims 1-4 and 5-7, each to stand or fall together, with separately argued claims 1 and 5, respectively. 37 C.F.R. § 41.37(c)(1)(vii).

In the second rejection, Appellants separately argue only claim 5. We therefore treat claims 5-7 as a group, to stand or fall together, with claim 5. 37 C.F.R. § 41.37(c)(1)(vii).

Appellants make similar arguments regarding the first and second rejections. Regarding the first rejection, the Examiner finds ‘759 discloses a Cu-based alloy having constituents in ranges overlapping claims 1 and 5, and tensile and electrical conductivity properties (Ans. 3). The Examiner further finds ‘759 does not disclose the tensile property as yield strength, but these properties are about the same because of the spring property of the material. *Id.* The Examiner concludes that Appellants’ claimed ranges would have been obvious because they overlap with the ranges disclosed by ‘759 (Ans. 4).

With regard to claim 1, Appellants contend any *prima facie* case of obviousness is rebutted by their showing that the claimed ranges are critical. Appellants contend that the titanium range of 0.35-5.0% recited in claim 1 provides the composition with new and unexpected results with regard to the claimed values of electrical conductivity and yield strength (App. Br. 4). Appellants contend the prior art does not necessarily possess the claimed physical properties because ‘759 does not disclose the critical claimed range of 0.35-5.0% titanium (App. Br. 5). Appellants further contend ‘759 merely

discloses a genus of copper alloys that may include titanium and merely invites further experimentation to find Appellants' claimed species of copper alloy possessing the claimed yield strength and electrical conductivity such that Appellants' claimed alloy is non-obvious (App. Br. 6).

With regard to claim 5, Appellants similarly argue that '759 fails to disclose a copper alloy having the claimed titanium and nickel ranges recited in claim 5, which Appellants believe are critical to achieve the claimed yield strength and electrical conductivity (App. Br. 6). Appellants further argue that '759 merely discloses a genus of copper alloys that may include titanium, which invites further experimentation to determine the copper alloy species claimed by Appellants such that the claimed alloy is non-obvious (App. Br. 7).

Appellants make similar arguments regarding the § 103 rejection over '246 or '864. Specifically, Appellants contend that '246 or '864 fails to disclose the claimed ranges of titanium and nickel and thus, cannot inherently possess the claimed yield strength or electrical conductivity (App. Br. 9). Appellants moreover argue that '246 and '864 merely disclose a genus of copper alloys containing titanium and nickel that invite further experimentation to determine Appellants' claimed copper alloy such that the claimed alloy is non-obvious (App. Br. 9-10).²

² Appellants additionally argue that the second rejection lacks motivation for "combining the known elements of JP 2001181759 [i.e., '759] that would result in the fashion claimed in the present patent application" (App. Br. 10). This argument is not understood because '759 was not used in the second rejection. In the context of this motivation argument, Appellants argue that '246 and '864 fail to mention whatsoever the titanium or nickel content required to achieve the unexpected yield strength and electrical conductivity (App. Br. 11). Again, we fail to see the relevancy of this argument because

ISSUE

Have Appellants shown the Examiner reversibly erred in concluding the claimed ranges of constituents and the claimed physical properties of claims 1 and 5 would have been obvious over '759 or that claim 5 would have been obvious over '246 or '864?

FINDINGS OF FACT (FF)

1. '759 discloses a copper alloy for electronic materials of superior strength and electric conductivity, comprising 1.5-4.0% Ni, 0.3-1.2% Si, 0.05-0.20% Mg, and 0.005-2.0% of one or more of the following elements: Zn, Sn, Fe, Ti, Zr, Cr, Al, P, Mn, Ag or Be, the balance comprising Cu and unavoidable impurities (claim 2; p. 7, ¶ [0009]).
2. '759 teaches that Ni, together with Si after the aging-hardening treatment, result in markedly increased strength and electrical conductivity maintained at high levels (p. 8, ¶ [0012]).
3. '759 teaches that Ti, Zr, Al and Mn improve the strength and heat resistance of Cu-Ni-Si alloys, as well as improve hot rolling characteristics (p. 12, ¶ [0020]).
4. '759 teaches one example of a copper alloy comprising Ni (2.20%), Si (0.40%), Mg (0.11%) and Be (0.007%), but no Ti. (p. 14, ¶ [0023], Table 1). This alloy exhibits a tensile strength of 725 N/mm², and electrical conductivity of 52% IACS. (p. 16, ¶ [0027], Table 2).
5. '759 teaches another copper alloy comprising 2.11% Ni, 0.52% Si, 0.06% Mg, 0.01% Ti and 0.03% Cr. (p. 14, ¶ [0023], Table 1). This

the Examiner does not combine the teachings of '246 and '864, but rather applies them alternatively.

alloy exhibits a tensile strength of 678 N/mm² and 52% IACS (p. 16, ¶ [0027], Table 2).

6. ‘246 teaches a copper alloy for electrical connector parts that may include, *inter alia*, by weight, 0-10% Ni, 0-1% Ti, 0-1% Mg and 0-3% Fe (claim 3; p. 10, ¶ [0011]).

7. ‘246 discloses that the copper alloy has improved spring characteristics and is used as an electrical conductor (¶ [0021]). In other words, the copper alloy must have good strength and electrical characteristics.

8. ‘864 teaches a copper alloy that may include 0.01-4.0 wt.% Ni, 0.01-1.0 wt.% Ti, 0.01-1.0 wt.% Mg and 0.01-3.0 wt.% Fe (claim 2; p.5, ¶ [0004]).

9. ‘864 teaches that Ti, Co, Fe and Ni, when added to a Cu-Si alloy, intensify the deposition of Si and, as a result, increases wear resistance. The preferred content of Ti is between 0.05-1.0%, for Cr is between 0.05-1.0%, for Fe and Co is between 0.1-2.5% and for Ni is 0.3 to 4% (p. 7, ¶ [0007]).

10. ‘864 teaches one example (Example 10) of the invention has a Ti content of 0.86%, and an electrical conductivity of 59% IACS (p. 9, ¶ [0010], Table 1). It does not disclose the yield strength or tensile strength of this alloy.

11. ‘864 discloses that the copper alloy has superior resistance to electric-discharge wear (¶ [0003]).

12. In the Specification, 6 alloys (J345, J346, J347, J348, J351 and J354) are listed with their compositions, the compositions being within the constituent ranges of claim 1 (Spec. 13, Table 1). However, only J345 (yield

str. = 107 KSI, EC = 57.8 %IACS) clearly meets the physical and electrical properties of claim 1. J347 (yield str. = 105 KSI, EC = 49.9 %IACS) borders the claimed properties. The other alloys do not meet both the claimed yield strength and electrical conductivity properties (Spec. 15, Table 3).

PRINCIPLES OF LAW

“Section 103 forbids issuance of a patent when ‘the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.’” *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1734 (2007).

The question of obviousness is resolved on the basis of underlying factual determinations including (1) the scope and content of the prior art, (2) any differences between the claimed subject matter and the prior art, (3) the level of skill in the art, and (4) where in evidence, so-called secondary considerations. *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966),

“In cases involving overlapping ranges, we and our predecessor court have consistently held that even a slight overlap in range establishes a *prima facie* case of obviousness. *In re Peterson*, 315 F.3d 1325, 1329 (Fed. Cir. 2003). “In fact, when … the claimed ranges are completely encompassed by the prior art, the conclusion is even more compelling than in cases of mere overlap.” *Id.* at 1330. Even without complete overlap of the claimed range and the prior art range, a minor difference shows a *prima facie* case of obviousness. *In re Harris*, 409 F.3d 1339, 1341 (Fed. Cir. 2005). “In

general, an applicant may overcome a *prima facie* case of obviousness by establishing ‘that the [claimed] range is critical, generally by showing that the claimed range achieves unexpected results relative to the prior art range.’” *Peterson*, 315 F.3d at 1330 (quoting *In re Geisler*, 116 F.3d 1465, 1469-70).

Objective evidence of nonobviousness must be commensurate in scope with the claims which the evidence is offered to support. The showing of unexpected results must be reviewed to see if the results occur over the entire claimed range. *In re Clemens*, 622 F.2d 1029, 1036 (CCPA 1980).

Where the claimed and prior art products are identical or substantially identical, the PTO can require an applicant to prove that the prior art products do not necessarily or inherently possess the characteristics of the claimed product. *In re Best*, 562 F.2d 1252, 1255 (CCPA 1977).

A patent that discloses a multitude of effective compositions including those claimed by applicant does not render any particular formulation less obvious. *Merck v. Biocraft Labs.*, 874 F.2d 804, 807 (Fed. Cir. 1989). Cf *In re Jones*, 958 F.2d 347 (Fed. Cir. 1992) (The patent did not disclose applicant’s claimed compound or even a generic compound having structural similarity to applicant’s claim species such that applicant’s claimed species was non-obvious). analysis

35 U.S.C. § 103 REJECTION OVER ‘759: CLAIMS 1 AND 5

The Examiner finds ‘759 teaches a copper alloy having the claimed constituents in ranges overlapping the claimed constituents (Ans. 3; FF 1). We agree with the Examiner’s finding which Appellants do not dispute. Specifically, ‘759 discloses a copper based alloy composition having

titanium and nickel amounts that overlap those recited in Appellants' claims 1 and 5, respectively. '759 discloses ranges of constituents that overlap the claimed ranges, presenting a strong *prima facie* case that Appellants' claimed ranges would have been obvious. *Peterson*, 315 F.3d at 1330. But, Appellants may overcome a *prima facie* case of obviousness by establishing that the claimed range is critical, in that the claimed range achieves unexpected results relative to the prior art range. *Id.*

Appellants contend the claimed alloy achieves unexpectedly good yield strength and electrical conductivity due to the amount of titanium, and titanium and nickel recited in claims 1 and 5, respectively. However, as evidence, Appellants cite only Example 7 of '759 (see FF 5), involving a Cu alloy with 0.1% Ti, which is outside the claimed titanium range. (App. Br. 5). This single data point outside the claimed range is insufficient to establish that the claimed titanium range produces unexpectedly good results with regard to yield strength and electrical conductivity properties. *In re Hill*, 284 F.2d 955, 959 (CCPA 1960).

Moreover, Appellants have not compared the claimed copper based alloy with '759, the closest prior art. '759 includes titanium concentrations that overlap the claimed range. However, Appellants have not shown unexpected results over the entire claimed range (i.e., unexpected results must be commensurate with the claimed invention) as required. In fact, Appellants have not even provided evidence of a comparison of the overlapping titanium concentration values (i.e., 0.35-2.0%) of '759 with the claimed copper-based alloy values in an attempt to establish unexpected results over the overlapping range. Accordingly, we are unpersuaded by

Appellants' evidence and arguments regarding criticality of the claimed titanium concentration.

With regard to claim 1, Appellants also contend that the prior art does not necessarily possess the characteristics of the claimed alloy, citing *In re Best*, 562 F.2d 1252, 1255 (CCPA 1977). However, Appellants' only reason that the prior art does not necessarily possess the characteristic is that '759 does not explicitly disclose the characteristic (App. Br. 5), which is insufficient to establish that the claimed properties are not inherently in the claimed composition. Under *Best*, once the Examiner has shown the prior art and the claimed alloys reasonably appear to be the same or substantially the same, the characteristics can be presumed to be possessed by the prior art, and Appellants have the burden of putting forth affirmative evidence that the prior art alloy does not inherently possess the claimed characteristics *Best*, 562 F.2d at 1255.³

With regard to claims 1 and 5, Appellants also argue that the '759 reference is merely an invitation to further experiment to find the species from a broad genus, citing *Metabolite Labs, Inc. v. Lab. Corp. of Am. Holdings*, 370 F.3d 1354 (Fed. Cir. 2004). (App. Br. 6). However, the present application is distinguishable from *Metabolite Labs* on its facts. In

³ We note that Appellants argue that alloys with similar compositions do not necessarily have the same properties because the properties depend on the method used to form the alloy (Reply Br. 3). Appellants cite to their Specification as showing that alloys with compositions within the claimed ranges do not necessarily have the claimed properties (Reply Br. 3). However, Appellants have not made the requisite showing that '759's alloy compositions do not inherently possess the claimed yield strength and electrical conductivity properties. Moreover, Appellants' claims are directed to a composition or product, not a method or product-by-process claim, which would require consideration of the method used to form the product.

Metabolite Labs, the patent at issue claimed a method of detecting a deficiency of cobalamin or folate in a human patient by correlating with an elevated level of total homocysteine in the bodily fluids. The prior art (Refsum) disclosed that homocysteine should be used to investigate “perturbations of homocysteine metabolism in humans during disease or pharmacological interventions that affect metabolism of one-carbon compounds.” *Id.* at 1367. However, Refsum did not specifically mention cobalamin or folate deficiencies as being associated with homocysteine levels. The Court held that Refsum merely invited further experimentation to find the claimed cobalamin or folate associations. *Id.*

In contrast, ‘759 does not merely invite further experimentation to discover a species because it explicitly discloses the claimed alloy constituents, including the titanium and nickel concentrations that overlap the claimed titanium and nickel concentrations, and the desirable properties obtainable from incorporating the constituents in disclosed amounts that overlap the amounts claimed by Appellants (FF 1,3). In other words, though ‘759 discloses a multitude of compositions, it does not render any particular composition less obvious. *Merck*, 874 F.2d at 807.

After giving full consideration of Appellants’ evidence and arguments, we determine they have not rebutted the Examiner’s prima facie case of obviousness of claim 1 or 5 over ‘759. We sustain the § 103 rejection over ‘759.

35 U.S.C. § 103 REJECTION OVER ‘246 AND ‘864: CLAIM 5

‘864 and ‘246 disclose copper alloys having constituents overlapping the ranges of those in claim 5 (FF 6, 8), such that Appellants’ claimed

composition would have been obvious. *Peterson*, 315 F.3d at 1330. In traversing the rejection, Appellants argue they “believe” that the claimed ranges of titanium and nickel are critical to achieve the unexpectedly good yield strength and electrical conductivity (App. Br. 8). In support of this argument, Appellants refer to one alloy disclosed in their Specification (FF 10), having a yield strength of 105 KSI and an electrical conductivity of 49.9% IACS. But, as before, Appellants’ belief does not constitute evidence. Instead, the extent of their evidence in the one datum of the J347 alloy of Example 8 is not commensurate in scope with the claimed titanium and nickel ranges. *Clemens*, 622 F.2d at 1036.

Appellants also argue that ‘864 and ‘246 do not necessarily possess the characteristics of the “improved combination of yield strength and electrical conductivity (such as a yield strength of 105 KSI and a conductivity of at least 50% IACS)” (App. Br. 9). But, with respect to claim 5, this argument is immaterial, as the claim does not recite any particular numerical values for the yield strength or electrical conductivity property.

Moreover, ‘246 and ‘864 both disclose that the copper alloys have good strength or wear, and electrical properties for use as electrical connectors such that there is a reasonable basis to believe that an alloy with a similar composition would possess the same improved strength and electrical properties. Accordingly, Appellants have the burden of showing that the copper alloys of ‘246 or ‘864 do not possess the claimed properties. *Best*, 562 F.2d at 1255. Appellants’ mere statement that ‘246 and ‘864 do not disclose the specifically claimed range of titanium or nickel does not satisfy their burden. In fact, Appellants have not even addressed the overlapping portion of the disputed titanium and nickel ranges.

We are unpersuaded by Appellants' argument that '246 and '864 disclose too many combinations of elements such that Appellants' claims to the particular ranges of titanium and nickel are non-obvious (App. Br. 9-10). As noted above, the fact that a multitude of composition formulations are disclosed does not render any one of them less obvious. *Merck*, 874 F.2d at 807. This proposition applies especially where, as here, '246 and '864 do not merely invite further experimentation to discover a species but, rather, explicitly disclose the claimed alloy constituents, including titanium and nickel concentrations that overlap the disputed titanium and nickel concentrations (FF 6-11). Moreover, '864 discloses the desirable properties obtainable by incorporating the constituents in disclosed amounts that overlap the amounts claimed by Appellants (FF 9).

In consideration of the evidence and arguments, we determine Appellants have not refuted the Examiner's *prima facie* case. Accordingly, we sustain the § 103 rejection of claim 5 and the represented claims over '246 or '864.

DECISION

The first rejection of claims 1-7 under 35 U.S.C. § 103(a) over '759 is affirmed.

The second rejection of claims 5-7 under 35 U.S.C. § 103(a) over '864 or '246 is affirmed.

TIME PERIOD FOR RESPONSE

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED

PL initial:
sld

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